DuPont Nutrition & Biosciences Study Demonstrates Stress-Modulating Effects of Candidate Probiotics in Mouse Model of Chronic Stress

Supplementation with certain bacteria such as Lactobacillus paracasei Lpc-37® shown to alleviate adverse effects of stress in rodents.

WILMINGTON, Del. (PRWEB) February 20, 2020 -- A collaborative research study between DuPont Nutrition & Biosciences and Amylgen, a research center which specializes in rodent models of neurodegenerative and psychiatric disease, analyzed the effects of differing probiotic strains on the behaviors and neuroendocrine responses of chronically stressed mice.

This study builds on the established notion that changes in gut microbiota affect mood and cognition by delving deeper and examining the performance of different strains in comparison to each other.

The Study Design

This study took a systematic approach to test the efficacy of 12 candidate probiotics strains from 10 species/subspecies of Bifidobacterium and Lactobacillus on stressed mice. The strains were tested across four screening experiments and the three most promising strains were re-tested to validate the results. The mice were orally administered the individual probiotic strains for five weeks, during which a three-week daily chronic restraint stress procedure was imposed on mice within stressed groups. On the final week of probiotic intervention and post the three-week stress procedure, all mice entered a behavioral test paradigm to measure stress-related behaviors. Furthermore, in the validation experiment, corticosterone and adrenocorticotropic hormones were analyzed to measure the neuroendocrine response to stress, as well as additional tissue samples collected for further analyses. Of the 12 candidate probiotics, Lactobacillus paracasei Lpc-37®, Lactobacillus plantarum LP12407, Lactobacillus paracasei LP12418, and Lactobacillus plantarum LP12151 prevented stress-associated anxiety- and depression-related behaviors from developing compared with chronically stressed mice in the placebo group. In addition, Lpc-37®, LP12407 and LP12418 prevented stress-associated deficits in cognitive function from developing.

Fantastic Opportunities for Novel Approaches to Anxiety and Depression

“Up to now, we have been using our rodent models for screening classical drugs aiming at psychiatric conditions,” stated Francois Roman, Ph.D., Scientific Board Member and Co-founder of Amylgen.

“The therapeutic improvement for the treatment of psychiatric diseases using the classical drug discovery process has been very disappointing and has not been able yet to bring satisfactory solutions for the treatment of neuropsychiatric disorders such as anxiety and depression. Novel approaches such as the one described in this paper opens fantastic opportunities for the discovery of new therapeutic strategies for the treatment of these disorders conducive to stress that need to be clinically translated.”

“This study demonstrated that this pre-clinical model of stress is suitable for screening candidate probiotic strains for psychological health benefits toward preventing stress-related disruptions in behavior from developing. This study highlighted the extent of screening required to discover successful candidate probiotic strains which could influence gut-brain axis communication,” said Elaine Patterson, Ph.D., Senior Scientist, DuPont Nutrition & Biosciences.
“Out of the 12 candidate probiotic strains tested, we identified three candidate strains which prevented all behavioral impairments from developing in mice caused by chronic daily restraint stress. These promising results may have future implications in the development of novel probiotic supplements which may offer a benefit to humans feeling the negative effects of daily stress. We are excited to explore whether these results can be translated to humans. We also demonstrated unique strain-specific effects concerning potential mechanistic pathways worth exploring in follow-up studies, and perhaps even in different models.”

You can read the full study at https://doi.org/10.1016/j.bbr.2019.112376.

About Amylgen

Amylgen proposes rodent models of neurodegenerative and psychiatric diseases allowing the rapid testing of new drugs with validated predictive value.

Amylgen services have been proven to facilitate the decision-making process at critical phases of drug development. Furthermore, Amylgen evaluates nutraceutical products aiming the field of "brain health" or "healthy brain ageing."

About DuPont™ Danisco®

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About DuPont Nutrition & Biosciences

DuPont Nutrition & Biosciences applies expert science to advance market-driven, healthy and sustainable solutions for the food, beverage, dietary supplement and pharmaceutical industries. We also use cutting-edge biotechnology across a range of markets to advance bio-based solutions to meet the needs of a growing population, while protecting our environment for future generations. We are innovative solvers who help our customers turn challenges into high-value business opportunities. For more information: http://www.dupontnutritionandbiosciences.com or http://www.biosciences.dupont.com.

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